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MINERAL INDUSTRY SURVEYS

Mark Schaefer, Interim Director

Reston, VA 20192

For information, contact:

E. B. Amey, Gold Specialist, (703) 648-4969, Fax: (703) 648-7757

Henry E. Hilliard, Silver and Platinum-Group Metals Specialist (703) 648-4970

E-mail: eamey@usgs.gov and hhiliard@usgs.gov

E. J. Hemphill (Data), (703) 648-7974

MINES FaxBack: (703) 648-4999

Internet: <http://minerals.er.usgs.gov/minerals>

PRECIOUS METALS IN AUGUST 1997

U.S. mines produced 28,100 kilograms of gold and 142,000 kilograms of silver in August 1997. Production of silver was up by about 12% in Nevada and 14% in Arizona. Total silver production in August was up by about 8%.

Gold

Domestic.—An industry group, the Gold Institute, forecasts that worldwide exploration expenditures of U.S. gold producers in 1997 will be 12% below the level of 1996. Recent delays in permitting accelerated the movement of exploration capital from the United States and led to record exploration in other countries (Reuters, Ltd., 1997).

International.—Gold demand, monitored by the World Gold Council, reached 723 metric tons of gold in the second quarter of 1997. This represents a 11% increase over last year's second quarter figure. Demand in developing countries, including China, India, and the Gulf States rose 20%. In the developed markets, demand fell 2% from 1996; jewelry demand was again a strong performer (Platt's Metals Week, 1997a).

According to the World Gold Council, Europe's share of the global gold fabrication market has fallen steadily from 40% in 1968, when Europe held the single largest share in the world, to 22% in 1996. This drop has occurred despite the 50% increase in European gold manufactured during the same period (Metal Bulletin, 1997).

Gold Fields of South Africa Ltd. and Gencor Ltd. will combine their gold mining assets to form the world's largest gold mining company. This new powerhouse entity will be called Goldco Ltd.; it will combine three of South Africa's biggest gold mines: Driefontein, Kloof, and Beatrix. Goldco Ltd. is expected to produce 4 million troy ounces of gold per year and hold total reserves of 120 million ounces of gold. The restructuring is being accomplished via mergers, exchange of mineral rights to make mining areas more viable, elimination of management contracts between mining companies and finance

houses to remove layers of management, and introduction of more flexible work practices (Platt's Metals Week, 1997d).

Sardinia Gold Mines celebrated the first pour at its Furtei Mine on the Island of Sardinia off the coast of Italy. The project has a nominal capacity of 25,000 ounces of gold per year but is likely to produce up to 40,000 ounces of gold. Currently, the project is based on a mining reserve of 911,000 tons at a grade of 3.14 grams of gold per ton (Mining Journal, 1997).

Golden Eagle International opened the Cueva Playa open pit gold mine in Cangalli, Bolivia, on September 7, processing 600 to 800 tons of head materials per day but is projected to process at 1,000 to 2,000 tons per day after production processes are fine tuned (Platt's Metals Week, 1997b).

Platinum-Group Metals

The price of palladium increased to a 17-year high of \$245.50 per troy ounce at the London morning fixing on August 5. On the New York Mercantile Exchange, the September contract for palladium was up \$6.90 to \$222.50 per ounce. Traders cited speculative trading, along with the uncertainty over the quantity of palladium Russia will deliver this year, as the main reasons for the market's unusual behavior. Russia exported 3.95 million ounces in 1996 which accounted for two-thirds of the world's supply. During the first half of 1997, Russian shipments of palladium were limited. This created a shortage causing the price to increase to about \$200 per ounce. Palladium traded in the range of \$115.75 to 149.95 per ounce in 1996. Russian exports have now resumed. To complicate the situation further, the Russians reportedly have been shipping palladium only in ingots, not sponge, which is the widely used form of palladium for catalytic converters and other applications. Auto catalyst manufacturers were affected most by the shortages created by the lack of Russian supplies because in recent years they have been using more palladium-based catalytic converters in place of the traditional three-way

converters. The shortage of palladium sponge forced most auto catalyst manufacturers to buy ingots and pay refiners to return them as sponge. As a result, a large premium developed for palladium sponge over ingot (Platt's Metals Week, 1997c).

Meanwhile, platinum prices declined. Domestic merchants quoted platinum prices in the range of \$423 to \$426 per ounce on August 11, 1997, down from \$425 to 437 the previous week. Johnson Matthey Inc.'s base price for platinum was \$427 per ounce, down \$10 from the previous week. By the end of August, Johnson Matthey's base price was down to \$411 per ounce (American Metal Market, 1997).

New Process Uses Less Platinum in Coating Power Tube Grids.—Sputter-coating power tube grids with a platinum-base coating instead of cladding reduces the quantity of precious metals required by 15 to 30%, according to one fabricator. Ordinarily, platinum-clad molybdenum grid wire is produced with a very thick precious metals coating. However, coating the wire by the sputter process reportedly not only saves material cost but is capable of reducing secondary emissions. An active diffusion barrier prohibits interdiffusion of the core and coating, and produces highly consistent coating. The sputter process is computer-controlled, which eliminates thickness

variations. It also enables codeposition of alloys and compounds that cannot be mechanically worked or alloyed by other techniques (Advanced Materials & Processes, 1997).

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TABLE 1
MINE PRODUCTION OF RECOVERABLE GOLD AND SILVER IN THE UNITED STATES, BY STATE 1/

(Kilograms)

	Arizona	California	Montana	Nevada	Other States 2/	Total
Gold:						
1996:						
August	158	1,880	1,010	19,300	5,250	27,600
September	232	1,920	968	18,500	5,600	27,200
October	223	1,920	1,140	19,100	5,330	27,800
November	125	1,860	929	18,000	4,810	25,700
December	124	1,980	876	19,800	5,210	28,000
Jan.-Dec. r/	1,740	23,800	9,110	213,000	69,900	318,000
1997:						
January r/	W	1,800	948	18,500	5,600	26,900
February r/	W	1,800	659	16,400	5,430	24,300
March r/	W	1,850	671	20,400	5,310	28,200
April r/	W	1,850	618	18,900	5,730	27,100
May	102	1,830 r/	640 r/	19,700 r/	5,970 r/	28,300 r/
June r/	74	1,770	W	20,400	6,020	28,300
July r/	W	1,790	648	20,600	5,620	28,600
August	W	1,830	474	20,400	5,440	28,100
Jan.-Aug.	176	14,500	4,660	155,000	45,100	220,000
	Arizona	California	Idaho	Nevada	Other States 3/	Total
Silver:						
1996:						
August	13,600	1,470	18,600	53,900	45,800	133,000
September	13,000	1,330	18,000	57,200	37,500	127,000
October	12,500	1,450	18,600	67,700	35,800	136,000
November	13,900	1,340	17,700	48,900	32,200	114,000
December	14,100	1,250	17,800	58,300	34,800	126,000
Jan.-Dec. r/	188,000	21,600	229,000	605,000	530,000	1,570,000
1997:						
January	11,200	1,560 r/	W	63,000 r/	61,700 r/	138,000 r/
February	10,300	1,530 r/	W	44,700 r/	62,100 r/	119,000 r/
March	14,700	1,810 r/	W	60,200 r/	56,400 r/	133,000 r/
April	12,600	2,110 r/	W	56,500 r/	62,900 r/	134,000 r/
May	13,500	1,880 r/	W	45,400 r/	67,700 r/	128,000 r/
June	14,600	1,720 r/	W	59,400 r/	61,800 r/	137,000 r/
July r/	13,200	W	W	57,300	60,800	131,000
August	15,000	W	W	64,300	62,700	142,000
Jan.-Aug.	105,000	10,600	W	451,000	496,000	1,060,000

r/ Revised. W Withheld to avoid disclosing company proprietary data; included with "Other States."

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes Alaska, Colorado, Idaho, New Mexico, South Carolina, South Dakota, Utah, Wisconsin, and State indicated by symbol "W."

3/ Includes Alaska, Colorado, Michigan, Missouri, Montana, New Mexico, New York, South Carolina, South Dakota, Utah, Wisconsin, and State indicated by symbol "W."

TABLE 2
SELECTED PRECIOUS METAL PRICES

(Dollars per troy ounce)

	Gold	Silver	Platinum	Palladium
Engelhard Industries:				
1996:				
Year:				
Low/date	368.67 (Dec. 03)	4.67 (Dec. 03)	368.00 (Dec.16)	117.00
High/date	391.06 (Aug .05)	5.82 (Feb. 02)	433.00 (Feb. 05)	146.00
Average	389.08	5.20	397.97	130.39
1997:				
July:				
Low/date	318.49/09	4.22/17	405.00/15	178.00
High/date	334.92/01	4.65/02	436.00/01	219.00
Average	324.88	4.35	415.52	195.61
August:				
Low/date	320.54/06	4.35/05	406.00/27	200.00
High/date	328.91/11	4.79/29	453.00/05	246.00
Average	325.24	4.52	426.23	221.57
September:				
Low/date	321.65/17	4.58/17	419.00/03	197.00
High/date	333.31/30	5.23/30	435.00/30	206.00
Average	323.91	4.74	425.95	200.38
Year to date:				
Low/date	318.49 (July 09)	4.22 (July 08)	403.00 (June 02)	177.00
High/date	367.82 (Jan. 01)	5.30 (Mar. 14)	490.00 (June 06 & 09)	246.00
Average	340.44	4.77	396.53	175.04
Handy and Harman:				
1996:				
Average	387.81	5.18	XX	XX
1997:				
July	324.08	4.35	XX	XX
August	324.03	4.51	XX	XX
September	322.74	4.72	XX	XX
Year to date	339.26	4.76	XX	XX
London Final:				
1996:				
Average	387.70	5.20	XX	XX
1997:				
July	324.10	4.36	XX	XX
August	324.01	4.49	XX	XX
September	322.82	4.73	XX	XX
Year to date	339.35	4.77	XX	XX

XX Not applicable.

Source: Platt's Metals Week.

TABLE 3
U.S. IMPORTS AND EXPORTS OF GOLD, BY COUNTRY 1/

(Kilograms of gold content, unless otherwise specified)

Country	Ores and concentrates 2/	Dore and precipitates	Refined bullion 3/	Total	Waste and scrap 4/ (gross weight)
Imports for consumption:					
1996	3,460	11,900	143,000	159,000	13,000
1997:					
May	38	1,880	17,100	19,100	1,080
June	345	662	12,300	13,300	1,440
July:					
Australia	--	41	--	41	--
Brazil	--	--	3,460	3,460	--
Canada	--	226	8,570	8,800	58
Chile	9	--	--	9	1
Colombia	--	--	328	328	40
Dominican Republic	--	--	31	31	370
Mexico	63	631	194	888	267
Netherlands Antilles	--	--	348	348	41
Peru	--	--	751	751	2
Switzerland	--	--	1,750	1,750	--
Uruguay	--	--	731	731	--
Other	--	10	958	968	281
Total	72	908	17,100	18,100	1,060
Year to date	1,300	8,560	118,000	128,000	7,090
Exports:					
1996	374	65,100	406,000	471,000	89,900
1997:					
May	--	5,550	47,200	52,700	5,130
June	--	5,990	57,400	63,400	4,900
July:					
Canada	71	2,740	207	3,020	1,720
China	--	--	1,120	1,120	--
France	--	--	--	--	1,360
Germany	12	--	64	76	109
Hong Kong	--	--	2,520	2,520	--
Korea, Republic of	--	--	2,020	2,020	--
Mexico	--	--	1,440	1,440	--
Switzerland	--	--	4,220	4,220	--
Taiwan	--	--	536	536	--
United Kingdom	--	2,010	5,320	7,330	514
Other	--	1	185	186	308
Total	83	4,750	17,600	22,500	4,010
Year to date	272	37,000	309,000	346,000	33,100

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes gold content of base metal ores, concentrates, and matte imported for refining.

3/ Bullion also moves in both directions between U.S. markets and foreign stocks on deposit in the Federal Reserve Bank. Monetary gold excluded.

4/ "Waste and scrap" not included in "Total."

Source: Bureau of the Census.

TABLE 4
U.S. IMPORTS AND EXPORTS OF SILVER, BY COUNTRY 1/

(Kilograms of silver content, unless otherwise specified)

Country	Ores and concentrates 2/	Dore and precipitates	Refined bullion	Total	Waste and scrap 3/ (gross weight)
Imports for consumption:					
1996	153,000	281,000	2,580,000	3,010,000	1,810,000
1997:					
May	8,210	43,600	119,000	171,000	176,000
June	21,200	21,900 4/	189,000	233,000	183,000
July:					
Canada	2	10 4/	94,400	94,400	6,190
Chile	315	23,700 4/	--	24,000	5
Dominican Republic	--	--	--	--	63
Germany	--	--	--	--	34,500
Malaysia	--	--	--	--	19,300
Mexico	12,000	440	55,300	67,700	7,110
Peru	--	--	9,550	9,550	--
Philippines	--	--	--	--	14
United Kingdom	--	--	--	--	414
Other	--	26	--	26	487
Total	12,300	24,200	159,000	196,000	68,000
Year to date	82,200	203,000	1,170,000	1,460,000	864,000
Exports:					
1996	1,520	43,300	2,900,000 5/	2,950,000	1,280,000
1997:					
May	--	6,280	434,000	305,000	94,000
June	--	6,470	941,000	947,000	78,200
July:					
Belgium	--	--	--	--	5,570
Canada	13,200	--	21	13,200	38,200
China	--	300	--	300	2,410
France	--	--	--	--	504
Germany	--	--	--	--	1,780
Hong Kong	--	--	--	--	279
Japan	--	--	18,700	18,700	22,600
Korea, Republic of	--	--	--	--	35
Mexico	--	--	--	--	1,490
Switzerland	--	--	--	--	4,980
Taiwan	--	1,400	--	1,400	--
United Arab Emirates	--	--	53,300	53,300	--
United Kingdom	--	200	149,000	149,000	1,280
Uruguay	--	--	2,170	2,170	--
Other	--	1,180	--	1,180	232
Total	13,200	3,070	223,000	239,000	79,400
Year to date	29,000	47,800	1,600,000	1,670,000	561,000

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes silver content of base metal ores, concentrates, and matte imported for refining.

3/ "Waste and scrap" not included in "Total."

4/ All or part of these data have been referred to the Bureau of the Census for verification.

5/ Verification of Bureau of the Census exports was not possible for some months of 1996.

Source: Bureau of the Census.

TABLE 5
U.S. IMPORTS AND EXPORTS OF PLATINUM-GROUP METALS, BY COUNTRY 1/

(Kilograms of metal content, unless otherwise specified)

Country	Ores and concentrates	Waste and scrap (gross weight)	Refined						
			Platinum	Palladium	Rhodium	Iridium	Osmium	Ruthenium	
Imports for consumption:									
1996	1,960	5,060	73,700	2/	146,000	9,650	1,810	329	15,600
1997:									
May	--	595	6,870		7,050	211	43	--	5,780
June	--	591	5,820		8,240	628	61	--	293
July:									
Belgium	--	--	306	3/	977	--	--	--	--
Canada	--	56	359		306	--	--	--	--
China	--	--	--		174	--	--	--	--
Germany	--	--	195	3/	958	3/	15	9	31
Japan	--	--	125		1,230	1	--	--	--
Mexico	--	--	11		3	1	--	--	--
Norway	--	--	67	3/	140	3	--	--	--
Russia	--	--	28		2,580	270	--	--	--
South Africa	--	--	3,660		1,340	269	177	18	437
Switzerland	--	--	310		755	269	6	--	--
United Kingdom	--	186	880	3/	2,080	--	24	3/	51
Other	--	166	122		90	--	--	--	--
Total	--	408	6,070		10,600	828	217	18	519
Year to date	--	3,030	43,900		58,500	4,370	904	36	6,590
Exports:									
1996	484	8,640	12,700		26,700	196	123	4/	
1997:									
May	21	1,300	1,260		4,960	2	355	4/	
June	50	1,730	2,900		5,320	54	32	4/	
July:									
Belgium	--	10	595		526	--	--		
Canada	--	13	38		81	--	--		
France	--	--	499		142	--	--		
Germany	--	584	169		99	--	--		
Hong Kong	--	--	--		--	--	--		
Ireland	--	--	176		215	47	--		
Italy	--	10	13		11	--	--		
Japan	--	458	660		120	--	1	4/	
Korea, Republic of	1	--	--		69	4	1	4/	
Mexico	1	--	4		444	--	--		
Netherlands	--	--	158		167	--	--		
South Africa	--	--	--		295	--	--		
Switzerland	11	--	779		20	5	--		
Taiwan	45	--	2		476	--	--		
United Kingdom	--	541	107		138	--	--		
Other	--	45	964		72	--	--		
Total	58	1,660	4,160		2,880	56	2	4/	
Year to date	482	8,100	14,400		26,500	134	442	4/	

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Of this amount, 2,070 kilograms was in the form of platinum coins.

3/ All or part of these data have been referred to the Bureau of the Census for verification.

4/ Includes osmium and ruthenium.

Source: Bureau of the Census.